

# Analysis of developing non-timber forest products of Sanjiang Plain, Northeast China

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**Abstract:** The Sanjiang Plain is a vast area of alluvial floodplains and low hills in northeast Heilongjiang Province. Because of the excessive land reclamation in the past, the whole forest area and the quality have decreased. In the view of sustainable development, this paper analyzed the possibilities for Non-timber Forest Product in terms of developing potentialities, markets, social effects and the status of NTFPs in several counties of Sanjiang Plain. The result showed that, active development and management for NTFPs is an optimistic option to how to balance the wetlands conservation and sustainable economic development.

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## Introduction of Sanjiang Plain

The Sanjiang Plain is a vast area of alluvial floodplains and low hills in northeast Heilongjiang Province, China. It is characterized by the confluence of three major rivers, the Heilong River (Amur in Russia), the Wusuli River (Ussuri in Russia), and the Songhua River. The original vegetation was a vast tract of wetlands, meadows and forests, but most of them have been dramatically reduced by agricultural development during the last 50 years. Forests, including wetland forests, muskeg and riparian woodlands, formerly covered as much as 71% of the Sanjiang Plain area, today covered only 11% of the land area, and total forest area amounts to approximately 1.1 million  $\text{hm}^2$ , with over 0.7 million  $\text{hm}^2$  of natural forests and almost 0.4 million  $\text{hm}^2$  of forest plantations. Sanjiang Plain is a general topographic region, not a political unit, usually defined as 18 rural counties and 7 cities (urban counties) (Liu 2002), the total population is approximately 9 million, with approximately 4.5 million of those living in the 18 rural counties.

## Analysis of non-timber forest products (NTFPs) possibilities of Sanjiang Plain

### Definition of NTFPs

Some commonly collected NTFPs include medicinal plants (like ginseng, goldenseal), wild foods (such as mushrooms, berries, roots, syrups, honey), decoratives and floral greens (like ferns, boughs), flavors and fragrances (balsam fir), fibers (bark, sweet grass, lichen), wild native seeds and transplants (for restoration and nursery stock), plant dyes, arts and crafts materials, and resins and saps (turpentine). The term NTFP is not based on a biological or ecological category but rather is a political economic category useful for highlighting overlooked values and biodiversity that can occur when timber production is the primary focus of forest management (Jones *et al.* 2004).

NTFPs have been recognized internationally as an important element in sustainable forestry, and sustainable forest management as a key element in sustainable economic development. Interest in NTFPs is increasing rapidly nowadays, and there are numerous efforts to increase awareness of these products, their management and market potential.

### Potentialities of NTFPs development

Sanjiang Plain has multiple vegetation types and it is noteworthy for its rich biodiversity. There are 1 777 kinds of vascular bundle plants which belong to 119 families and 543 genera in this area, in which over 900 species can be used for Non-timber forest products such as herbal medicines, wild berries, fungi, apiculture, as well as edible potherbs etc (He 2000). Due to climate and natural vegetation reasons, the Sanjiang Plain and surrounding areas are suitable to develop NTFPs.

Based on statistics (Zhou 2005a), more than 18 sorts of herbal medicine have major markets in China and even in Southeast Asia, and most of them can be developed in the Sanjiang Plain. Some species such as Ginseng (*Panax ginseng*), Fritillaria, *Schisandra*, *Gastrodia*, *Astragalus*, *Asarum* and *Gentiana* could provide substantial economic benefits. Some NTFPs are unique in the Sanjiang Plain, such as products derived from black bees. Additionally, edible potherbs in this area are rich in species and quantity. Some species like *Pteridium*, *Athyrium*, *Matteuccia*, natural nuts, and mushrooms could be successful in domestic and export markets.

It deserves to be mentioned is that, most of the cities and counties in Sanjiang Plain have a shortage of timber resources due to recent logging restrictions and to the fact that existing forest stands, and plantations in particular, are mostly under harvest age. NTFPs can be used to supplement or supplant timber cutting from forests.

NTFP opportunities are separated from forest plantations at present, the main goal of forest plantations is to provide timber products, employment from plantation establishment and treatment, and to improve the environment of the Sanjiang Plain wetlands, but major benefits from plantation establishment and treatment normally require 10 to 20 years. The economic benefit of forest plantations can be strengthened even further through integrating NTFPs into forest plantations in this period. For example, forest plantations along with herb medicine cultivation, or

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wild berries, edible potherb collection, and black bee breeding are an optimistic option, and there seems to be no problem in developing several NTFPs in combination with plantation forests from technical and ecological standpoint. In this way, not only benefits, but also the stability of pure plantation forests can be improved.

### Markets for NTFPs

NTFPs have large markets in China and abroad. With social development, natural food products have become popular both in China and worldwide. NTFPs such as herbal medicine, berry products, fungi, apiculture products and edible potherbs are included among these products. Market demand is relatively strong and markets have expanded along with price increases in past years. For example, at the provincial level the market price of Jew's-ear (black fungi) (*Hirneola auricula-judae*) has increased substantially in the past five years: during 1998–1999, the market price of Jew's-ear was about RMB 16 yuan/kg and in 2003 the price reached around RMB 70 yuan/kg for good quality products; the price of berry fruit increased from RMB 0.4 yuan/kg in 1980 to RMB 6 yuan/kg in 2003; the market value of some herbal medicines has also increased quickly: in 2001 the price of *Fritillaria* was only RMB 12–15 yuan/kg, but in 2003 it has averaged RMB 70 yuan/kg with a maximum of RMB 100yuan/kg. The situation is similar with edible potherbs and apiculture products. The main edible potherbs species in Heilongjiang Province are *Pteridium aquilinum*, *Aralia elata* and some wild Mushroom species.

Not only prices but also consumption is increasing. Formerly, only local people would eat Jew's-ear, edible potherbs and other organic products, but at present, more and more typical north-eastern NTFPs are being transported to the southern part of the country and even abroad. Additionally, some are already becoming famous organic trademarks in China. Table 1 shows the price trends of some NTFPs in three years.

**Table 1. Price Changes of NTFP in several Counties from 2001–2003 (RMB/kg)**

Products	Price			Counties
	2001	2002	2003	
<i>Fritillaria</i>	90.00	120.00	140	Baoqing
<i>Schisandra</i>	31.25	36.75	42.25	Jixian, Baoqing, Huanan, Mishan
<i>Pteridium</i>	1.76	1.88	2.04	Baoqing, Hulin, Mishan, Linkou, Boli
Jew's Ear	41	44.00	47.00	Baoqing, Hulin, Huanan, Mishan, Tongjiang, Boli

### Potential social effects of NTFP development

With the shortage of timber resources, and the recently imposed partial logging ban, the income of dwellers especially forest farmers has been reduced. The local people and governments are seriously concerned about finding alternatives to improve their living standards. If NTFPs are widely developed in Sanjiang Plain, this appears to be an obvious opportunity to improve the employment and income levels.

As we know, Gathering forest species for food, medicine, shelter, and other uses, most NTFP extraction is done by hand. Usually, herb medicine cultivation in the forest will require at least 2–3 persons/hm<sup>2</sup> more of labor than pure forest cultivation,

and for wild berry collection, 4–5 person/hm<sup>2</sup> will be needed during the harvest season. For black bee breeding, every 100 hive of bees will provide employment opportunities for three people. For Jew's-ear fungi cultivation, every 100 000 RMB of investment will provide around 10–15 employment opportunities.

In additionally, the surveys demonstrate that, the annual income of bee farmers is around 5 000 RMB/year, for Jew's-ear cultivation, the annual benefit for a household is about 10 000–15 000 RMB. Wild potherb and berry collection are also available opportunities to improve incomes for vulnerable groups.

### The status of NTFPs in Several Counties

The investigation has been done in the counties of Hegang, Luobei, Baoqing, Raohe, Hulin, Linkou, Huanan, and Boli. An important consideration raised by personnel of the various County Forestry Bureaus is that with the present economic situation of the forestry sector as affected by the Natural Forest Protection Program, employment opportunities in forestry work are limited. Therefore, many counties are exploring the possibility of developing or expanding NTFP activities. NTFP opportunities brought up by the counties are summarized in Table 2.

**Table 2. Summary of NTFP Interventions Proposed by Counties**

Counties	NTFP Type		
Baoqing	Medical plants	Bee products	
Boli	Medical plants	Potherbs	Wild fungus
Hegang	Medical plants	Potherbs	Wild fungus
Huanan	Wild fruits	Wild fungus	
Hulin	Wild fungus	Bee products	
Jidong	Medical plants	Potherbs	
Jixian	Potherbs		
Linkou	Potherbs		
Luobei	Medical plants	Potherbs	Wild fruits
Raohe	Medical plants	Bee products	

Black bee products are a special case within NTFPs of Sanjiang Plain area. Of the counties interested in NTFPs, three (Baoqing, Hulin and Raohe) are active in the production of honey and other black bee products. These products are largely commercialized and their production constitutes an established business. However, given the success of these products in national and international markets, it is important to develop further the sources of nectar on which these bees feed, the most important of which is a species of *Tilia*. One option being considered for further expansion of black bee products is the development of *Tilia* plantations. Growing *Tilia* in the nursery is not fully understood yet. Therefore, the possibility of obtaining grant support to develop production systems for growing *Tilia* in nurseries is being explored.

At present, the Department of Forestry of Heilongjiang Province intends to concentrate investments only on the most promising of these NTFPs, and explore the possibility of obtaining grant funding in order to develop a better understanding of markets, the understanding of traditional, and further development of appropriate production systems, and training on protection and propagation of NTFP plants.

## Summary

Sanjiang Plain is the largest tract of wetlands in China and East Asia out side of Siberia. Sanjiang Plain wetlands are ranked as globally important in the Directory of Asian Wetlands. It arouses worldwide attention to how to structure efficient conservation for the wetland biodiversity and sustainable economic development. Developing NTFPs is an ideal option to resolve the contradiction between economic development and environmental conservation. But there exists some main issues associated with NTFPs, such as the amount of natural resources which can be used to NTFPs is inaccurate presently, how much and how long should be harvested in one alternation. In addition, the markets, prices and production systems are quite unsteady as a result of lacking efficient management. NTFP development should also be considered as a long term activity, establish a wholly system include production, supply and market, and it deserves to be supported from the aspect of policy, fund and technique.

Active management for NTFPs will play an important role in restoring biodiversity and balance to damaged forests. Further-

more, extraction of a broader range of natural resources other than just timber products can lead to stability for forests and economic diversity for the economy in general. It is a win-win situation for all.

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